



React Programming

THE BIG NERD RANCH GUIDE

Loren Klingman & Ashley Parker

React Programming

THE BIG NERD RANCH GUIDE

Loren Klingman & Ashley Parker



Big Nerd Ranch

React Programming: The Big Nerd Ranch Guide

Table of Contents

Cover

Title Page

Copyright Page

Table of Contents

Introduction

- Learning Web Development

- Learning React

- Prerequisites

- How This Book Is Organized

- How to Use This Book

 - Typographical conventions

 - Using an eBook

- For the More Curious

- Challenges

The Necessary Tools

- Installing Google Chrome

- Installing Visual Studio Code

- Crash Course in the Command Line

 - Finding the current directory

 - Changing directories

 - Creating a directory

 - Listing files

 - Getting administrator privileges

 - Quitting a program

- Installing Node.js

Table of Contents

Resources

Finding Documentation and Help

Chapter 1 Create React App

Create React App

Running the Development Server

Navigating Your App

- Project metadata and dependencies

- public directory

- src directory

Customizing Your App

- Title

- Favicon

Adding Elements

Styles

The Chrome Developer Tools

Conclusion

Are You More Curious?

For the More Curious: npx

For the More Curious: %PUBLIC_URL%

Challenges

Bronze Challenge: Subtitle

Silver Challenge: Canarygram

Chapter 2 Components

App Organization

Header Component

JSX

Post Component

React Developer Tools

- Why name components?

Props

Table of Contents

Reusing a Component

Object destructuring

Rendering Lists

Keys

Conclusion

For the More Curious: Testing Prop Changes in the DevTools

Bronze Challenge: Footer

Silver Challenge: Canarygram Footer

Chapter 3 User Events

Adding SelectedItem

User Events

Passing Parameters

Conclusion

For the More Curious: Alternate file-naming conventions

For the More Curious: Detaching Event Handlers

Bronze Challenge: Hello, Goodbye

Silver Challenge: Canary Alert

Chapter 4 State

What Is State?

useState

Updating State

Conclusion

For the More Curious: Components Functions vs Classes

Gold Challenge: Canary Shuffle

Chapter 5 Linting

Creating a Project

Updating the Title and Favicon

Linting Overview

Linting Rules

Installing and configuring Airbnbs ESLint

Table of Contents

Running ESLint

- Auto-fixing errors

- Overriding ESLint rules

Installing the ESLint Extension in Visual Studio Code

Conclusion

For the More Curious: Shortcuts to Running ESLint in Visual Studio Code

For the More Curious: Linting Before Committing

Chapter 6 Prop Types

Adding Resources

Header Component

- Whitespace issues

- Adding the component to App.js

- Styling the header

Thumbnail Component

Prop Types

- Installing the prop-types library

Thumbnail Prop Types

Rendering Items

Home Component

Reusing Prop Types

Prop Mismatch

Conclusion

For the More Curious: Why Pass Items as a Prop?

For the More Curious: Inlining Images

Bronze Challenge: Add a Prop

Chapter 7 Styles

Style Scoping

Responsive Design

Media Queries

Hover Effect

Table of Contents

Animating the hover effect

Conclusion

For the More Curious: Grid Layout

For the More Curious: Styled Components

For the More Curious: Compiled CSS

Silver Challenge: Custom Effect

Chapter 8 Interacting with a Server

Setting Up the Server

Creating a proxy

Adding an HTTP request library

useEffect

Confirming the Network Request

Promises

How promises work

Conclusion

For the More Curious: Server Endpoints

For the More Curious: How to Set Up a Proxy in Production

For the More Curious: Cross-Origin Resource Sharing (CORS)

For the More Curious: useEffect vs Lifecycle Methods

Silver Challenge: Promise Practice

Chapter 9 Router

Creating Routes

Using Link

Creating the Details Page and Route

Nesting a route

Index route

useParams

Navigating Home from the Header

Navigating from Thumbnails to Details

Conclusion



Table of Contents

Silver Challenge: More Routes

Chapter 10 Conditional Rendering

Getting Additional Item Info

Undefined Items

if Statements

Inline Logical Operators

Fragments

More Logical Operators

The && operator

The || operator

The ?? operator

Boolean Type Conversion

Conclusion

For the More Curious: Truthy and Falsy Values

Silver Challenge: Promote Sale Items

Chapter 11 useReducer

useReducer vs useState

Implementing useReducer

The Reducer Function

Updating the Quantity

Displaying Information in the Header

Adding Items to the Cart

Action Creators

Conclusion

Chapter 12 Editing the Cart

Creating the Cart Page

Linking to the cart page

Viewing the Carts Contents

Displaying the Cart Contents

Displaying the item title and price

Table of Contents

Removing Items from the Cart

- Passing dispatch as a prop

- Setting up the remove button

Emptying the Cart

Displaying the Subtotal

Conclusion

Bronze Challenge: Increasing the Quantity

Silver Challenge: Decreasing the Quantity

Chapter 13 Forms

Building the Form

- onSubmit

- Value from Inputs

Controlled Components

- onChange

- Calculating the Tax

- Calculating the Total

- Displaying the total conditionally

- Formatting Input

- Form Validation

- Conclusion

- Silver Challenge: Coupon Code

- Gold Challenge: Maintaining the Cursor Position in the Phone Number

- Gold Challenge: Setting the Quantity

Chapter 14 Local Storage and useRef

- Local Storage

- useRef vs useState

- Using setTimeout with useRef

- Accessing DOM Elements

- Accessibility Considerations

Table of Contents

Conclusion

Silver Challenge: Returning Focus to the Name Input

Chapter 15 Submitting Orders

Submitting a Form

async/await

Comparing async/await and then/catch

Preventing Inadvertent Submissions

Conclusion

Bronze Challenge: Reset the Cart State

Silver Challenge: How Many Orders Are in the Queue?

Chapter 16 Component Composition

Alert

Conditionally Showing an Alert

Component Composition with Props

Reusing Alert

Emptying the Cart

Conclusion

Gold Challenge: Closeable Alert

Chapter 17 Context

Getting the Logged-In User

Login Button

Avoiding Prop Drilling

Passing currentUser with Context

useMemo

useContext

Login Component

useNavigate

Logout Button

Login Error

Conclusion

Table of Contents

For the More Curious: Login Cookie

Silver Challenge: Items Context

Chapter 18 Fulfilling Orders

Creating the Orders Component

Orders Link

Fetching and Displaying Orders

Fulfilling Orders

Restricting Access with a Custom Hook

Custom hooks

Adding to the dependency array

Cleaning Up useEffect

Getting New Orders

Proxying a websocket

Using the websocket

Closing the websocket

Conclusion

Bronze Challenge: Smarter Redirect

Bronze Challenge: Import a Custom Hook

Silver Challenge: Loader

Silver Challenge: Error Display

Chapter 19 Introduction to App Performance Optimization

React Profiler

Memo

Context Changes

useCallback

Expensive Calculations

Comparing useCallback, useMemo, and memo

Cleaning Up

Conclusion

Silver Challenge: Memoized UserDetails



Table of Contents

Chapter 20 Testing Overview

Deciding What Tests to Use

Why are you testing?

What do you want to know?

What does the future look like?

Types of Testing

Static Testing

Unit and Integration Testing

Unit testing for functions

Integration testing for components

Testing the full app

Snapshot testing

End-to-End Testing

End-to-end testing with a live back end

End-to-end testing with a mocked back end

Which to use?

Visual or Screenshot Testing

Conclusion

Chapter 21 Testing with Jest and the React Testing Library

Housekeeping

Unit Testing

Integration Testing

Testing Thumbnail

Testing Home

Mocking the Server

Testing the Logged-In Users Username

Testing Navigation

Testing the Add to Cart button

Testing checkout

Verifying order submission

Checkout Error

Table of Contents

Mocking console.error

Conclusion

For the More Curious: File Structure for Test Files

For the More Curious: React Testing Library Queries

Bronze Challenge: Testing Removing an Item from the Cart

Silver Challenge: Additional cartReducer Tests

Silver Challenge: Testing Phone Number Formatting

Silver Challenge: Testing Tax Details

Gold Challenge: Additional Login Tests

Chapter 22 End-to-End Testing

Installing and Configuring Cypress

Configuring scripts

Setting up ESLint for Cypress

Importing commands

Setting the base URL

Testing the Login Flow

Testing the Checkout Flow

Interacting with the server

Testing errors in the checkout flow

Testing the Flow to View and Delete Orders

Clearing the orders

Factoring Out Custom Commands

Invisible Elements

Avoiding Flaky Tests

Conclusion

For the More Curious: Cypress Media Files

For the More Curious: Cypress Network Requests

Silver Challenge: Testing Phone Number Formatting

Silver Challenge: Testing Cart Details

Silver Challenge: Testing Removing an Item from the Cart

Gold Challenge: Additional Tests

Table of Contents

Chapter 23 Building Your Application

Manifest

Building the Application

Deploying Your Application

Conclusion

Chapter 24 Data Loading

Production Build

Analysis

Large Images

Analyzing JavaScript Files

Lazy Loading

Naming the bundles

Other Considerations

Conclusion

Gold Challenge: Lazy Loading

Chapter 25 Component Speed

Inspecting Performance

Transitions

Storing Rendered Content

Storing a Rendered Component

Conclusion

Gold Challenge: Caching the Filtered Data

Chapter 26 Afterword

The Final Challenge

Shameless Plugs

Thank You

Index